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AUTHOR Tekian, Ara; And Others
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ABSTRACT

This paper describes a quantitative model that can be used to evaluate faculty performance for promotion decisions. Through the use of an evaluation form, the system (1) informs faculty members how they will be evaluated at the end of each academic year; (2) allows faculty growth to be documented in teaching, research, and other activities which affect promotion; and (3) provides a common basis for a Promotion Committee to deal fairly and objectively with evaluating faculty performance. Although this model was designed for use with health professions faculty it can be adapted and used in other fields. An evaluation form has been designed which has two parts. Part I (Appendix A) is a questionnaire to gather information about the number and kinds of academic activities that faculty have performed (i.e., the quantitative aspects of their work) and is to be completed by the faculty member. Part II (Appendix B) is a rating scale to be completed by the department chairperson and three colleagues who are familiar with the candidate being rated. Ratings depict the qualitative aspects of faculty performance. The description of a pilot study illustrates the application of the model. (Author/PN)

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A QUANTITATIVE MODEL FOR ASSESSING FACULTY PROMOTION

Ara Tekian
Richard Foley
Agnes Rezler

Center for Educational Development
University of Illinois at Chicago

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A QUANTITATIVE MODEL FOR ASSESSING FACULTY PROMOTION

OBJECTIVES

This paper describes a quantitative model that can be used to evaluate faculty performance for promotion decisions. Through the use of an evaluation form, the system (1) informs faculty members how they will be evaluated at the end of each academic year, (2) allows faculty growth to be documented in teaching, research, and other activities which affect promotion, and (3) provides a common basis for a Promotion Committee to deal fairly and objectively with evaluating faculty performance. Although this model was designed for use with health professions faculty it can be adopted and used in other fields.

THEORETICAL FRAMEWORK

While great energy has been expended examining the knowledge of students who have completed their health sciences education, much less attention has been devoted to evaluating the faculty who teach them. Moreover, there has been little progress during the last decade to develop methods which assess faculty performance (Eble, 1972; Miller, 1972; Rippey, 1981), and no quantitative criteria have been suggested to assist promotion decisions (Miller, 1974; Rippey, 1981).

Efforts have been made to reduce the subjectivity inherent in promoting faculty (Spencer and colleagues, 1970; Robins, 1977; Gjerde and Colombo, 1982). While these contributions towards making methods for promotion more explicit are helpful, they do not provide a means by which faculty can be systematically evaluated. Actually, most promotion decisions remain norm-referenced rather than criterion-referenced. Faculty members tend to be compared with each other in a given year with no common denominator and members comprising promotion committees also change periodically. As a result decisions are usually more happenstance than systematic.

Within the health professions, success in academia generally depends upon performance in three or four areas: instruction, research and other scholarly activities, professional and public services, and administrative services. This model presents an approach to quantifying both the amount and quality of faculty activity in these areas.

METHODOLOGY

An evaluation form has been designed which has two parts. Part I is a questionnaire to gather information about the number and kinds of academic activities that faculty have performed (i.e., the quantitative aspects of their work) and is to be completed by the faculty member. Part II is a rating scale to be completed by the department chairperson and three colleagues who are familiar with the candidate being rated. Ratings depict the qualitative aspects of faculty performance.

Part I (Appendix A) consists of four sections: instruction, research and other scholarly activities, professional and public services, and administrative services. (An additional section about patient care might be attached when evaluating certain health professions groups). A series of questions about the workload in each area cover the general responsibilities in which faculty are typically engaged. Weights are assigned to different items in each section according to the time invested and the importance of each activity. Since teaching and research are the major and most time consuming responsibilities of most full-time academic faculty, they are given more weight than professional and public services and administrative services. The sum total of Part I reflects the workload and productivity of a faculty member during a given year. A set of weights is suggested for Part I (Appendix C) but the appropriateness of these weights would have to be reviewed by each institution or departments within an institution.

Part II (Appendix B) is a rating scale to be completed by the department chairperson and three peers. Fifteen characteristics, such as leadership ability and communication skills, are to be rated from unsatisfactory

to outstanding. Weights assigned for each rating range from 0 (unsatisfactory) to 1.5 (outstanding).

After completion of Parts I and II, the following equation is applied to calculate the coefficient of performance "C".

$$C = Q + \left(\frac{L_p + L_d}{2}\right)$$

Q (Quantity of Performance) = I + R + P + A

where

I = Sum of quantifiable instruction
R = Sum of quantifiable research and other scholarly activities
P = Sum of quantifiable professional and public services
A = Sum of quantifiable administrative services

$\left(\frac{L_p + L_d}{2}\right)$ Quality of Performance

where

L_p = The average of peer ratings
L_d = Ratings given by the chairperson of the department

PILOT STUDY

Part I of the questionnaire was administered to 12 faculty members within the same department in an academic health center. Three faculty mambers had just been promoted to the rank of assistant professor; four assistant professors had been in rank for three to five years; and five associate professors for four to five years.

Each of the 12 faculty members listed their activities for three academic years: 1979-80, 1980-81 and 1981-82. Information was requested for three years to determine changes in the quantity of performed activities.

The second phase of the project involved faculty assessment by peers and the department chairperson. Part II of the questionnaire was filled out by the department chairperson for each individual in the study. Additionally, three randomly selected peers at the same rank were also asked to fill out the forms. All information was confidential and code numbers were used for each faculty member so the data would be anonymous.

The following results are used to illustrate the application of this quantitative model. Since the sample size is very small, and since certain faculty members admitted that they did not always keep accurate records, particularly for 1979-80, the following scores must be interpreted cautiously.

RESULTS AND DISCUSSION

Quantity of Performance

The score "Q" reflects the quantity of performance for each faculty member in the areas of instruction (I), research and other scholarly activities (R), professional and public services (P), and administrative services (A). It was observed that the spread of Q-scores for assistant professors just promoted (3.A - 3.C) for the year 1981-82 ranged between 7.33 to 9.75 (Table 1-a), and the activities of highest involvement at that rank were instruction and research. For assistant professors 3 - 5 years in rank, the spread of Q-scores for the year 1981-82 ranged between 5.66 to 28.83, however, the spread without faculty member 2.B was between 16.75 to 28.83 (Table 1-b). It was noted that, besides I and R, activity P has increased (Table 1-b).

The spread of Q-scores for associate professors ranged between 16.67 to 28.17 for the year 1981-82, and it can be noted that there were significant increases in scores in areas P and A (Table 1-c). This indicates the tendency to move towards professional and public services and administration at the associate professor level.

The average quantity of performance (Q_{av}) was also computed for the years 1979-80 and 1980-81, and was compared with the last Q-score for 1981-82 to show progress over three years. It was noted that Q for 1981-82 was always higher than Q for the previous years (Q_{av}) for assistant professors just promoted and those 3 - 5 years in rank (Table 2). However, this was not the case with the associate professors where 2 out of 5 faculty members scored lower for the last academic year (Table 2, 1.C and 1.E). This seems to indicate that some faculty may not continue to

Table 1

Quantitative scores for the year 1981-82 for a) assistant professors just promoted, b) assistant professors 3 - 5 years in rank, and c) associate professors.

Table 1-a. Assistant professors just promoted

Faculty	Instruction "I"	Research "R"	Professional "P"	Administration "A"	Q(1981-82)= I+R+P+A
3.A	3.83	3.00	0.25	0.25	7.33
3.B	4.75	2.50	2.50	-	9.75
3.C	2.83	3.00	0.50	1.75	8.08
Mean Av.	3.80	2.83	1.08	0.66	8.38

Table 1-b. Assistant professors 3 - 5 years in rank

Faculty	Instruction	Research	Professional	Administration	Q(1981-82)
2.A	10.83	9.50	5.75	2.25	28.83
2.B	1.66	4.00	-	-	5.66
2.C	6.92	9.50	1.25	1.25	18.92
2.D	4.50	3.00	6.00	3.25	16.75
Mean Av.	5.98	6.50	3.25	1.69	17.54

Table 1-c. Associate professors

Faculty	Instruction	Research	Professional	Administration	Q(1981-82)
1.A	6.67	15.50	1.75	4.25	28.17
1.B	4.17	6.00	5.00	1.50	16.67
1.C	3.00	8.50	3.25	8.25	23.00
1.D	5.83	8.50	7.75	4.25	26.33
1.E	5.67	11.00	2.50	4.00	23.17
Mean Av.	5.07	9.90	4.05	4.45	23.46

Table 2

Q (Quantity of performance) scores for 1981-82 and average Q-scores for 1979-80 and 1980-81 for assistant and associate professors.

	Faculty	Q(1981-82)	Q_{av}(1979-81)
Assistant professors just promoted	3.A	7.33	5.45
	3.B	9.75	9.63
	3.C	8.08	6.50
Assistant professors 3 - 5 years in rank	2.A	28.83	13.83
	2.B	5.66	0.79
	2.C	18.92	9.45
	2.D	16.75	7.83
Associate professors	1.A	28.17	19.33
	1.B	16.67	10.63
	1.C	23.00	25.70
	1.D	26.33	21.95
	1.E	23.17	26.70

increase their productivity regularly after becoming tenured. However, the small sample size at each rank does not lend itself to generalization. The size of the error could be reduced by increasing the number of years for which information is available about each faculty member and by increasing the number of faculty members at each level.

Quality of Performance

Part II of the questionnaire consists of 15 characteristics. Each faculty member was rated on these characteristics by the department chairperson and three randomly selected peers of the same rank. The highest possible score on Part II is 22.5, (1.5 x 15), if all characteristics are rated as "outstanding". In the total sample the lowest obtained qualitative score was 4.82 and the highest 21.10, indicating substantial variation in the sample.

Since both the chairperson and the peers were evaluating each faculty member it was possible to compare their ratings. Averaged peer ratings were correlated with the chairpersons's ratings obtaining a rank-order correlation of .30. It seems that the chairperson used different criteria for rating faculty than peers. The items which were most influenced by rater biases were leadership ability, decision-making ability, capacity to work well with colleagues and quality of research. On these items the same individuals received both unsatisfactory and outstanding ratings from different raters. These four items elicit very discrepant evaluations and hence reduce the validity of the qualitative scores.

Quality and Quantity

Quality of performance ratings were correlated with Quantity of performance scores for all faculty members in the sample. Rank-order correlations are shown below:

Quantity vs Quality rated by peers = .55
Quantity vs Quality rated by the chairperson = -.30

There is a positive but moderate correlation for peers, but a slightly negative correlation for the chairperson. The quality of faculty performance, as judged by the chairperson, is independent of the quantity of faculty production. This means that the chairperson's appreciation of faculty members is not influenced by their teaching load, research productivity and other professional contributions.

CONCLUSION:

In the area of faculty promotions most decisions remain norm-referenced rather than criterion-referenced. The above described model can be used to quantify the amount and quality of faculty performance and reduce the subjectivity involved in such decisions. However, several questions need to be addressed regarding the validity, reliability and effectiveness of this model. For example, should there be minimum acceptable scores for different ranks? If so how should minimum scores be determined? What is the "cost" involved in making an incorrect decision - i.e., refuse promoting a faculty member and risk losing his services? On the other hand, uncertainty can best be expressed in probabilistic terms with the use of different types of mathematical optimization procedures (Winkler, 1972). The proposed equation which unites quantitative criteria with qualitative one demonstrates a model whereby a "reasonable" index of faculty performance could be attained and error could be reduced.

In conclusion, this model presents an approach to quantifying the amount and quality of faculty activity which can be used to evaluate faculty performance for promotion decisions. It also allows faculty growth to be documented in teaching, research, and other activities which affect promotion, and provides a common basis for a Promotion Committee to deal fairly and objectively with the evaluation of faculty performance. Although this model was designed for use with health professions faculty it can be adapted and used in other fields.

Appendix A

Name _____ Department _____ Date _____

Part I

A. Instruction "I"

Record the number of courses taught during the academic year (-) in the first column, and the number of credits in the second column. Also, provide specific documentation for each other item below including exact title, name of students, other instructors, topics and so forth.

	No. of courses	Total No. of credits
1. Number of courses taught to graduate students and total number of credits	___	___
2. Number of courses taught to undergraduate students and total number of credits	___	___
3. Number of courses directed/coordinated and total number of credits	___	___

Title of Course	Quarter/Semester and year	Other Instructors

4. Organized a University conference, symposium, workshop, continuing education activity, retreat.

	No. of activities
a. More than 2 days	
- Major coordinator	___
- Co-coordinator	___
b. One to 2 days	
- Major coordinator	___
- Co-coordinator	___

Title/topic	Quarter/Semester and year	Co-coordinators	Audience

5. Taught/supervised independent studies (not theses) for graduate students.

	No. of students
- Major advisor	___
- Minor advisor	___

Name of student	Topic	Quarter/Semester and year

6. Provided additional advisement to special students (eg. short-term fellows)

- Major advisor	___
- Minor advisor	___

Please, put any additional information that has not been considered in this section.

B. Research and other scholarly activities "R"

Articles/books which have been accepted for publication but not yet in print may be listed below. Item 13 includes only projects which were completed during the academic year (-) as a routine research activity, yet not for publication. If a research project was done jointly with the collaboration of more than one department, record the number of these projects in item 14. Also, provide specific documentation for each item below including references, names of students, thesis topics and so forth.

	No. of activities
1. Primary author of a book	___
2. Co-author of a book	___
3. Primary editor of a book	___
4. Co-editor of a book	___

Title	Author/Co-author Editor/Co-editor	Publisher	Year

5. Primary author of a chapter in a book	___
6. Co-author of a chapter in a book	___

7. Primary author of a monograph	___
8. Co-author of a monograph	___

9. Editorship of a journal	___
10. Manuscript referee	___

11. Primary author of journal articles	___
12. Co-author of journal articles	___

Title	Author/co-author	Journal	Year

13. Number of unpublished research projects done for the department ___

14. Number of interdepartmental research projects ___

15. Primary advisor of graduate students ___

16. Thesis committee member of graduate students ___

Name of student	Title of thesis	Committee members	Year

17. Number of refereed papers presented at professional meetings ___

18. Attracted grant money for research
    - Principle investigator ___
    - Co-investigator ___

Please, put any additional information that has not been considered in this section.

C. Professional and public services "P"

Each activity below may have been conducted at the local (city or state), national or international level. Record each activity in terms of its duration, specific organization and so forth.

1. Elected or appointed to an office of a professional society/organization. No. of activities

- Local ___
- National ___
- International ___

Organization | Office held/your role

2. Member of task forces, advisory committees, etc.

- Local ___
- National ___
- International ___

Organization/activity | Role | Duration

3. Consultation with associations, governments and institutions. This refers to an ongoing activity of some duration. (Does not include guest speaker,or instructor of a workshop or seminar).

- Local ___
- National ___
- International ___

Nature of activity | Direct supervisor (name and title) | Duration

4. Faculty, staff or invited speaker at workshops, conferences and seminars outside the University.

	No. of activities
- Local	___
- National	___
- International	___

Organization/activity	Topic	Date

5. Consultation to University Schools or Colleges, departments, or committees within a unit. ___

Unit	Activity	Duration

Please, put any additional information that has not been considered in this section.

D. Administrative services "A"

Please, provide specific documentation for each item below including exact title of activity, committee names and so forth.

	No. of activities
1. Is/was a department head/director	___
2. Is/was assistant or associate department head/director	___

3. Is/was a team leader or project director ___

4. Served on one or more major departmental committees (eg. Promotions, Educational Policy, Executive, etc.) ___

Committee	Position

5. Served on school/college committees ___

6. Participated in University-wide committees ___

Please, put any additional information that has not been considered in this section.

Appendix B

Name of faculty reviewed _____ Name of peer evaluator _____

Part II (To be completed by the Chairman of the Department and three peers)

Rate the faculty member concerned by recording 0, .50, 1, or 1.5 next to each statement, which best represents the degree to which he or she exhibits a given characteristic. If you have no information about an item record x.

Qualitative Criteria "L"	Unsatisfactory	Improvement needed	Satisfactory	Outstanding	Unable to observe
	0	.50	1	1.5	x
1. Relations to Chairman	___	___	___	___	___
2. Leadership ability	___	___	___	___	___
3. Dedication to service	___	___	___	___	___
4. Decision-making ability	___	___	___	___	___
5. Initiative (self-starting ability)	___	___	___	___	___
6. Innovative (uses new methods)	___	___	___	___	___
7. Capacity to work well with colleagues	___	___	___	___	___
8. Quality of research	___	___	___	___	___
9. Quantity of research	___	___	___	___	___
10. Adaptability to new responsibilities	___	___	___	___	___
11. Relations to students	___	___	___	___	___
12. Communication skills	___	___	___	___	___
13. Instructional skills	___	___	___	___	___
14. Motivation for continuing own education	___	___	___	___	___
15. Student evaluations of his teaching	___	___	___	___	___
		+ _____	+ _____	+ _____	
		=	=	=	

Sum total "L" =

Directions on how to compute quality of performance (L) scores for Part II.

If a faculty member was rated on less than 15 items because the rater was unable to observe the faculty member, the score should be corrected as follows:

- The faculty member will receive the average weight (sum total of "L" divided by the number of items rated) for all items not rated.

Example:

Qualitative Criteria "L"	Unsatis-factory	Improve-ment needed	Satis-factory	Outstand-ing	Unable to observe
	0	.50	1	1.5	x
1. Relations to Chairman	—	—	1	—	—
2. Leadership ability	—	—	1	—	—
3. Dedication to service	—	—	—	1.5	—
4. Decision-making ability	—	—	1	—	—
5. Initiative (self-starting ability)	—	—	—	—	x
6. Innovative (uses new methods)	—	—	1	—	—
7. Capacity to work well with colleagues	—	.50	—	—	—
8. Quality of research	—	—	—	1.5	—
9. Quantity of research	—	.50	—	—	—
10. Adaptability to new responsibilities	—	—	1	—	—
11. Relations to students	—	—	—	—	x
12. Communication skills	—	—	—	1.5	—
13. Instructional skills	—	—	—	1.5	—
14. Motivation for continuing own education	—	—	—	—	x
15. Student evaluations of his teaching	—	—	—	1.5	—
	+	+	+	+	
	= 1	= 5	= 7.5		$3 \times \frac{13.5}{12}$

Sum total "L" = $1 + 5 + 7.5 + (3 \times \frac{13.5}{12}) = 16.88$

Appendix C

The figures in parenthesis after each item show the weights assigned to different contributions. Each weight should be multiplied by the number of activities or students.

A. Instruction "A"

1-3. Courses taught to students or directed are calculated as follows: the total number of credits is divided by 3, i.e. every 3 credits are equivalent to 1 course.

4. Organized a University conference, symposium, workshop, continuing education activity, retreat.

   a. More than 2 days
      - Major coordinator (2)
      - Co-coordinator (1)

   b. One to 2 days
      - Major coordinator (1)
      - Co-coordinator (.50)

5. Taught/supervised independent studies (not theses) for graduate students.

   - Major advisor (.50)
   - Minor advisor (.25)

6. Provided additional advisement to special students (eg. short-term fellows)

   - Major advisor (.50)
   - Minor advisor (.25)

B. Research and other scholarly activities "R"

1. Primary author of a book (5)
2. Co-author of a book (4)
3. Primary editor of a book (4)
4. Co-editor of a book (3)
5. Primary author of a chapter in a book (2)
6. Co-author of a chapter in a book (1)
7. Primary author of a monograph (2)
8. Co-author of a monograph (1)
9. Editorship of a journal (4)
10. Manuscript referee (2)
11. Primary author of journal articles (1)
12. Co-author of journal articles (.50)
13. Number of unpublished research projects done for the department (.50)
14. Number of interdepartmental research projects (.50)

15. Primary advisor of graduate students (1)
16. Thesis committee member of graduate students (.50)
17. Number of refereed papers presented at professional meetings (.50)
18. Attracted grant money for research
    - Principle investigator (3)
    - Co-investigator (2)

C. Professional and public services "P"

1. Elected or appointed to an office of a professional society/organization.
    - Local (1)
    - National (3)
    - International (3)
2. Member of task forces, advisory committees, etc.
    - Local (.50)
    - National (1)
    - International (1.50)
3. Consultation with associations, governments and institutions. This refers to an ongoing activity of some duration. (Does not include guest speaker, instructor of a workshop or seminar).
    - Local (1)
    - National (1.50)
    - International (2)
4. Faculty, staff or invited speaker at workshops, conferences and seminars outside the University.
    - Local (.25)
    - National (.50)
    - International (1)
5. Consultation to University Schools or Colleges, departments, or committees within a unit (.50).

D. Administrative services "A"

1. Is/was a department head/director (4)
2. Is/was assistant or associate department head/director (2)
3. Is/was a team leader or project director (.50)
4. Served on one or more major departmental committees (.25)
5. Served on school/college committees (.50)
6. Participated in University-wide committees (.50)

LIST OF ABBREVIATIONS

I - Instruction

R - Research and other scholarly activities

P - Professional and public services

A - Administrative services

Q - Quantity of performance (I + R + P + A)

L_p - The average of peer ratings

L_d - Ratings given by the department chairperson

C - Coefficient of performance

1A - 1E - Associate professors

2A - 2D - Assistant professors 3 - 5 years in rank

3A - 3C - Assistant professors just promoted

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